



## Utilization of EOS™ Imaging for Evaluation of Bowel Management and Radiation Dose Reduction

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**Introduction:** This study assesses the impact on radiation dose of EOS™ imaging system (EOS) versus computed or digital radiography (CR/DR) to assess fecal burden on abdominal radiographs in children undergoing bowel management programs.

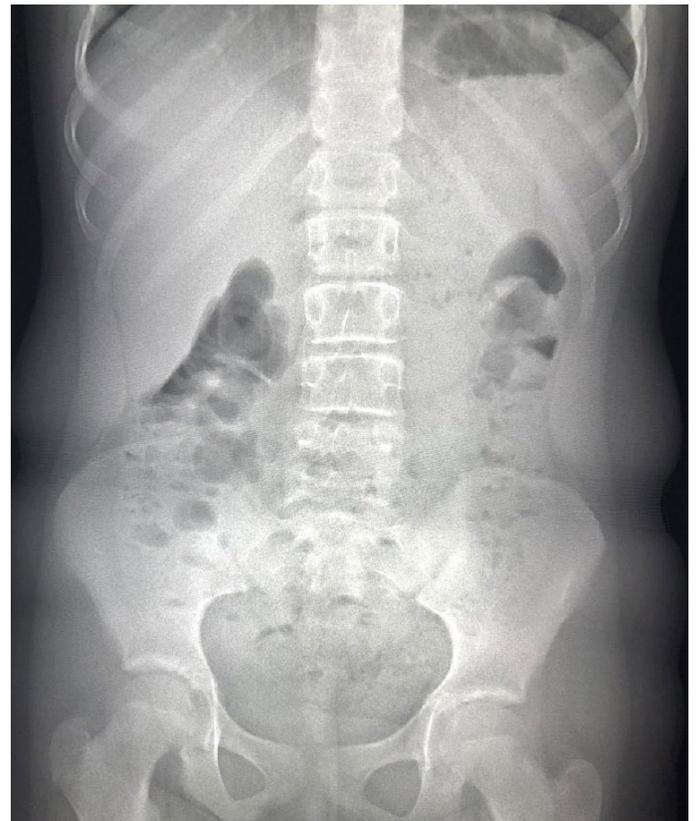
**Methods and Materials:** We retrospectively identified 39 patients in Shriner's Bowel Management Program being treated for chronic constipation who had abdominal radiographs obtained with EOS and CR/DR between 07/01/2017-05/30/2018. We compared dose area product (DAP) for EOS radiographs with DAP for CR/DR radiographs on the same patients. Dose comparison was performed with calculation of difference, percent dose reduction, and paired t test.

**Results:** Percent reduction in DAP ranged from 17.9% to 94.5%. Mean dose with EOS showed an overall decrease of 82% when compared to mean CR/DR DAP ( $p=0.005$ ).

**Discussion:** There is a constant drive for radiation dose reduction in children. The Image Gently campaign and ALARA principle promote using the lowest possible radiation dose, while obtaining diagnostic imaging. EOS allows for especially low radiation dose by being sensitive to photons and reducing scatter radiation. It utilizes slot scanning to image upright patients, acquiring AP and lateral images simultaneously, in two and/or three dimensions. EOS is usually used for orthopedic purposes, specifically bone alignment.

We found that EOS' ability to decrease radiation dose while maintaining image quality has another application. It is useful for children enrolled in bowel management programs. These children undergo multiple clean-out regimens and other bowel hygiene programs and require serial radiographs to evaluate stool burden. EOS makes it possible to evaluate trends in stool burden—and treatment efficacy—using lower radiation dose than CR/DR, without losing important diagnostic information.

**Conclusion:** An abdominal radiograph with short exposure time performed by EOS may decrease DAP compared to DR/CR in children in bowel management programs who have serial radiographs to evaluate stool burden.



**Figure 1:** Abdominal radiograph clearly depicts moderate stool burden